

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE



Attorney Docket No. 60953/119

In re patent application of:

HINTSCHE *et al.*

Serial No.: 09/142,660

Filed: December 23, 1998

For: **DETECTION OF MOLECULES AND MOLECULE COMPLEXES**

Group Art Unit: 1655

Examiner: Bradley L. Sisson

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AMENDMENT AND REPLY UNDER 37 C.F.R. § 1.116

Commissioner of Patents and Trademarks  
Washington, D.C. 20231

Sir:

This replies to the final Office Action dated August 1, 2000. A Petition for Extension of Time with the requisite fee is attached. Applicants do not believe that any further fees are needed, in the event this is not correct, applicants authorize the Commissioner to charge applicant's account No. 19-0741. Please amend the application as set forth below and consider the following Remarks.

IN THE CLAIMS

Please cancel claims 56 and 57 in favor of adding new claim 61, as follows:

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--61. A method of detecting a molecule or molecule complex in a diluent, solvent or gel, comprising:

- (a) contacting the molecule or molecule complex with an ultra-microelectrode array, said ultra-microelectrode array comprising at least two electrode structures, wherein the spacing between the electrode structures is less than 1  $\mu\text{m}$ ;
- (b) producing an alternating electric field between the electrode structures; and
- (c) measuring changes in current or potential between the electrode structures, whereby the changes in current or potential are caused by the molecule or the molecule complex.--

## **REMARKS**

### **Introduction**

This communication replies to the Office Action mailed August 1, 2000. New claim 61 is identical to previously entered claim 56, which applicants herewith cancel in order to respond the Examiner's objection to the ordering of the claims. No new matter is added with new claim 61 and entry thereof is proper.

### **Examiner's Objections and Rejections**

#### Objection to the Claims

In paragraph 2 of the Action, the Examiner objects to claims 58-60 as being separated from claim 21 by claims 56 and 57. In order to respond to this objection, applicants have cancelled claims 56 and 57 and reentered claim 56 as new claim 61. In view of this response, applicants respectfully request the Examiner to enter the above amendment and withdraw this objection.

#### Rejection of Claims Under 35 U.S.C. § 112, First Paragraph

**CONCLUSION**

In view of the foregoing amendments, remarks and attestations of Dr. Hintsche with supporting documentation, Applicants respectfully submit that the present claims are in condition for allowance. An early notice in this regard is respectfully requested. Should the Examiner have any questions regarding the present application or believe that further discussion will advance prosecution, the Examiner is invited to contact the undersigned at the number listed below.

Respectfully submitted,

*December 29, 2000*

Date

*Patricia D. Granados*

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Should additional fees be necessary in connection with the filing of this paper, or if a petition for extension of time is required for timely acceptance of same, the Commissioner is hereby authorized to charge Deposit Account No. 19-0741 for any such fees.

concludes from his work that the present specification provides ample guidance and direction to apply its principles to the entire field of biological molecules without any undue experimentation.

Finally, Dr. Hintsche asserts that his specification is not unlike other specifications in the biosensoric field for which patents have issued. That is they all lack detailed descriptions of the biochemical conditions required for applying their respective inventions to different molecules. Examples are attached in Appendices 5-8, for the Examiner's convenience.

In view of the above remarks based upon the attestations of Dr. Hintsch and his supporting documentations and description of the application of the present invention to a variety of molecules, Applicants respectfully request the Examiner to reconsider and withdraw the rejection under § 112, first paragraph.

The Examiner further rejects claim 57 under § 112, second paragraph, for reciting "about the size of a large molecule complex.". Applicants vigorously traverse this rejection as the specification provides a definition of this term. However, in further response Applicants point out that this rejection has been rendered moot with the cancellation of claim 57.

In paragraph 3 of the Action, the Examiner rejects claims 21-60 under 35 U.S.C. § 112, first paragraph, as not enabling one of skill in the art to make or use the invention. The Examiner maintains that “while being enabling for coating of an electrode with SH-biotin and detection/measurement of B-galactosidase and p-aminophenol, [the specification] does not reasonably provide enablement for the detection of any molecule complex in any diluent, be it in a purified state or not, and where the ultra-microelectrode array is fashioned of any material and is operated under any strength of electric field, any amplitude, and any frequency.” Applicants traverse this rejection as it is applicable to claims 21-55 and 58-61. In further response, Applicants respectfully direct the Examiner’s attention to the Rule 132 Declaration of Dr. Hintsche.<sup>1</sup>

Specifically, Dr. Hintsche explains that although experimentation is necessary to determine the specific variables for different molecules, such experimentation would have been routine to the skilled artisan in the field of the present invention (paragraph 2A). He further explains that there are no particular difficulties arising out of the application of the teachings of the specification to other molecules (paragraph 2B). In fact, the principles of the present invention are the same principles used in a variety of techniques, such as affinity binding, analytical throw-flow, and optical electrochemical biochip technology, that are well-known and well-accepted in the art and applicable to an array of different types of molecules.

Dr. Hintsche supports his statements with reference to attached publications and to actual work conducted in his laboratory. For instance, in paragraphs 2C and 2D, he describes his work reported at the 5<sup>th</sup> World Congress on Biosensors showing the application of the invention to the detection of DNA hybridization and to the detection of differences between “full-matching,” “mismatching” and “no-matching” and oligonucleotides using a 24-mer oligonucleotide sequence as probes. He also describes work determining complex formation of ferritin molecules. Example 3 also shows that the detection of a tumor marking agent cytokeratin 20 complexed to a respective catching oligonucleotide may be performed with the method of the invention without undue burden. He attests that this work was done in his own laboratory by Dr. Nebling. Dr. Hintsche

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<sup>1</sup> Dr. Manfred Paeschke’s executed Declaration is forthcoming.